

Multi-Technique Space Geodetic Observations to Low Earth Orbiting Satellites – Assessing Orbit Quality using SLR. R. J. Govind¹, ¹Division of Geomatics, University of Cape Town, Private Bag X3, Rondebosch, 7701, Cape Town, South Africa. Ramesh.Govind@uct.ac.za .

It is now common practice to equip Earth observing satellites (remote sensing, altimetry) with multiple space geodetic measurements for orbit determination – currently -- Jason-2 (DORIS, GPS, SLR), Cryosat-2 (DORIS, SLR), HY-2A (DORIS, GPS, SLR) and Sara (DORIS, SLR). The collocation of multiple geodetic measurement types at the satellite are also planned for future Earth observing missions such as HY-2B, Sentinel, Jason-3 and Jason-CS for high precision orbit determination and applications to geodesy. Using multiple observation types for orbit determination, validation, verification and accuracy assessments of the “operational” orbit product can be determined. SLR measurements are most fundamental to such a study of orbit quality. At the recently established multi-technique space geodesy computational facility at the University of Cape Town, the orbits of these satellites are determined using multiple data types and their trajectories are compared with respect to the SLR determined orbit and directly with the SLR measurements themselves. An accuracy assessment of the orbit quality is provided by comparing the trajectories from the individual technique solutions and the “residuals” obtained by passing the SLR data to the respective orbits.